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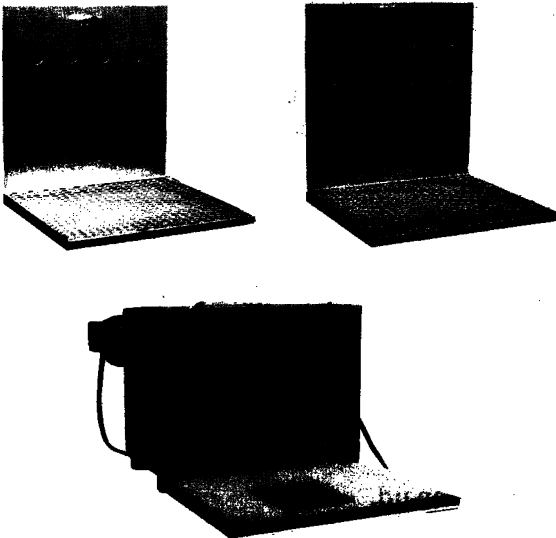
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PCS

Portable Computer Systems for Observational Research

PCS is a comprehensive software package designed to collect and analyze data on events or behaviors. Using a laptop computer to collect and store data, the user may generate frequency tables, reliability standards, and summary reports. Perform extensive analysis by transferring the data to an MS-DOS computer while using one of the PCS analysis programs included. All programs are menu driven; usage of the programs can be learned in a minimal amount of time.

PCS is available in a modular format. Start with **The PCS COLLECTOR**. Add more modules as your data analysis needs grow. **PCS** offers the most flexibility and power of any observational research package available today.

The PCS COLLECTOR - the foundation of all the PCS modules. Included:

OBSERVE - collects the data. With **OBSERVE**:

- record up to 45 different events or behaviors simultaneously
- activate three sets of mutually exclusive codes
- utilize a software timer alerting the user to the passage of uniform time increments.
- break an observation session into subsessions that indicate a change in environmental conditions
- temporarily suspend data collection when the subject(s) moves out of observable space
- print data stream and frequency tables

RELIABLE - compare the data files of two observers and generate tables of reliability scores for each code on either frequency or duration of individual codes

RETRIEVE - retrieve a data collection session that was recorded and stored earlier on the laptop. Data may be printed or analyzed.

Hardware required for The COLLECTOR: Epson HX-20 computer. Also available for Tandy 102 and MSDOS laptops in early 1989. Software Price: \$199

The PCS MOVER - transfer data from the laptop to an MS-DOS computer for data editing and analysis. Included:

SEND & RECEIVE - Use **SEND** (for the laptop) and **RECEIVE** (for the PC) in conjunction to move the data files from the laptop to the PC and ready them for the analysis programs available.

EDIT - substitute or combine codes in data files transferred to the PC.

COMBINE - merge two observers' simultaneously recorded data on the PC.

Hardware required for The MOVER: Epson HX-20 computer, MS-DOS computer and appropriate serial cable. Also available for Tandy 102 and MSDOS laptops in early 1989. Software Price: \$49

The PCS ANALYZER is a group of programs that analyze the collected data files transferred to an MS-DOS computer. Analyze up to 40 files as one group. Included:

NESTING - create tables reflecting occurrences within codes. User-defined codes can be nested three levels deep with five codes available under each level.

BOUT/INTERBOUT - generate tables displaying frequencies of each behavior's bout length or interbout length.

LAG - construct contingency tables to determine event and time-based conditional probabilities. Generate eight different tables on each set of data, allowing flexibility in viewing the data. Store these tables for import into SPSSX for lag analysis.

Hardware required for The ANALYZER: MS-DOS computer with 640K RAM. Software Price: \$99

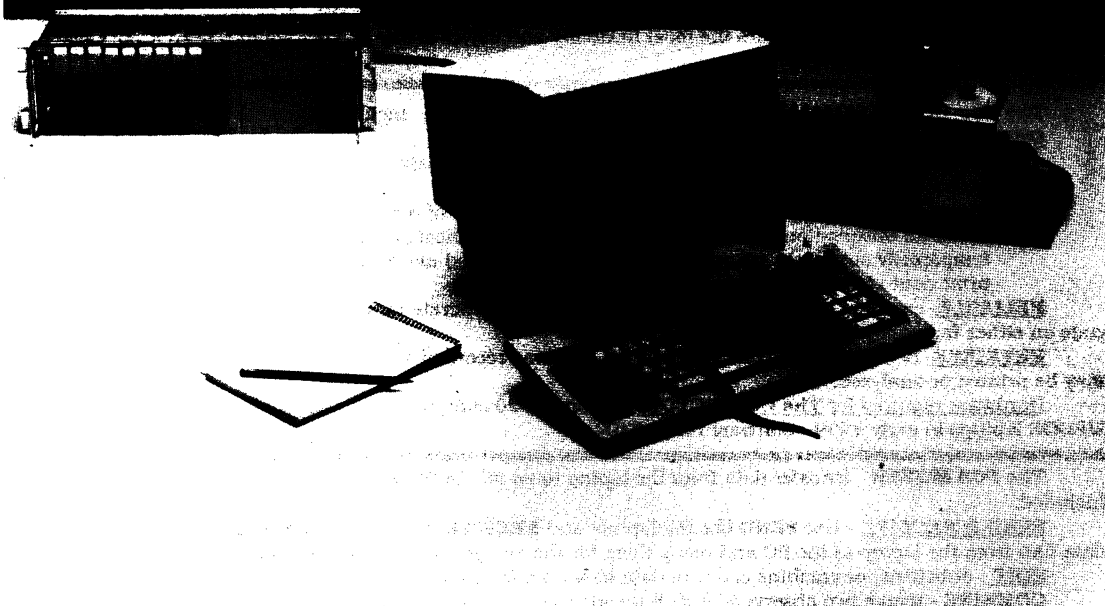
The PCS GRAPHER - generate graphs displaying frequency and duration data in an easy-to-understand format.

Hardware required for The GRAPHER: MS-DOS computer with 640K RAM. Software Price: \$49

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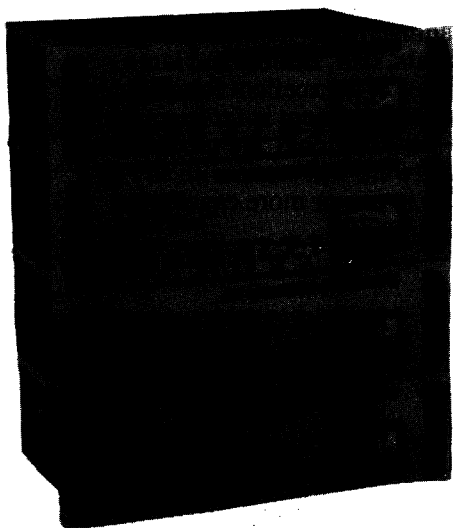


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SOFTWARE

1. For measuring motion of multiple objects moving across multiple user defined zones.

2. For the totalized motion of multiple objects in a single zone.

3. For distance traveled (in cm) and pattern of movements of multiple objects located in multiple user defined zones. (e.g. multiple animals located in separate cages-one animal per cage).

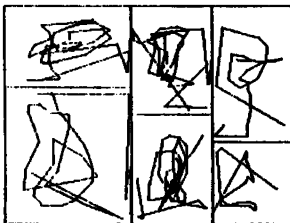
4. For rotations of a single animal. Can be combined with pattern of movements and distance traveled.

5. For "social contact" (time of contact and length of contact) between two animals.

6. For the number of visits, time spent and pattern of movements of a single

animal moving across many user defined zones (e.g. maze).

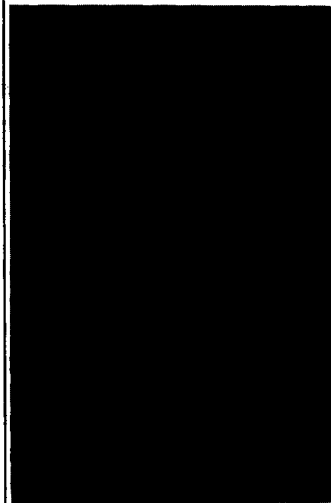
7. For counting the number of animals present at periodic intervals in each user defined zones.



Zone Name	Distance Traveled	Time Moving	Time Not Moving	Average Speed
A	21.0	1.16	28.4	13.3
B	54.4	6.2	23.8	8.8
C	61.5	3.6	26.4	17.0

8. "Water maze" program for measuring the pattern of movement and the distance traveled to the "goal" platform.

HARDWARE

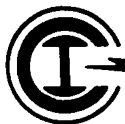


Other software designed on request.

SPECIFICATIONS:

- Image processing and acquisition speed: up to 30 frames/sec.
- Image resolution: 256 x 192 pixels, binary image.

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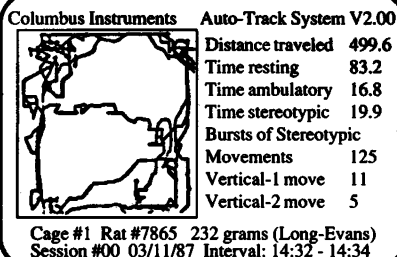
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- Can be used as an interface to IBM-PC/XT/AT compatibles or as a stand alone instrument.

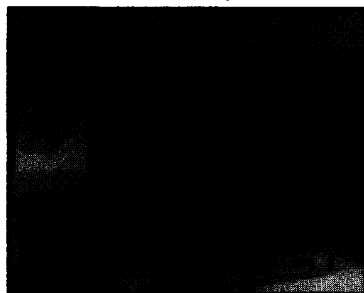
BIO-TECH EQUIPMENT FOR ANIMAL RESEARCH

- 1 to 16 cages (432mm x 432mm)
- IBM-XT/AT compatible.
- Stores "raw data" (x,y,z,t) animal coordinates for 24 hours on the hard disk.
- Plots patterns of animal movements from all cages.
- Separates ambulatory activity, rearing, rotations, time spent in different locations etc.
- Infrared beam principle. 15 x 15 horizontal IR beams plus 15 vertical beams.
- Also available with large animal cages 1m x 1m.

Animal Activity Meters- "Auto-Track" System

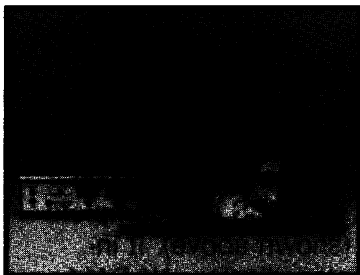


Data printout and screen display



Auto-Track four cage system

Inexpensive Activity Meter- "Mini"

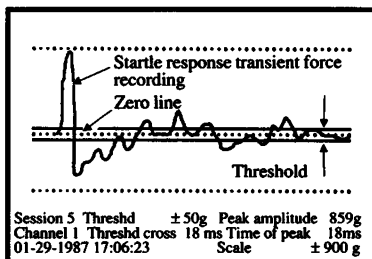


- Works with standard molded plastic cages, 15 IR beams projected side to side.
- Separates ambulatory from non-ambulatory activity.
- Interfaces to computers.
- Can be combined in larger systems.

Equipment is also available for measuring:

- Cardiac output.
- Respiration rate, $\dot{V}O_2/CO_2$.
- Animal coordination-Rota rods.
- Tail-Flick/Hot plates.
- Blood Pressure.
- Shuttle Boxes.
- Animal Activity by video image analysis.

Startle Response meter for 1 to 8 animals "Responder-X"



Data printout and screen display

The IBM-PC/XT/AT based Startle Response Meter plots response curve and measures all startle response parameters for 1 to 8 animals.

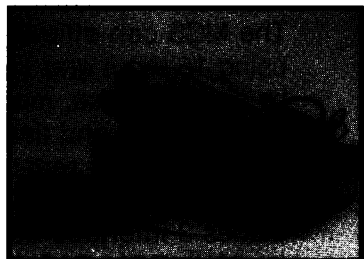
It is also available in an economical version for 1 animal.

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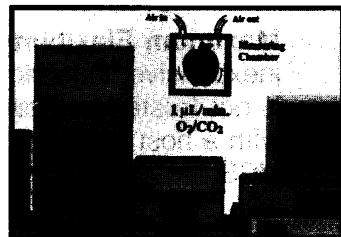
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Animal Exerciser allows $\dot{V}O_2/CO_2$ measurements

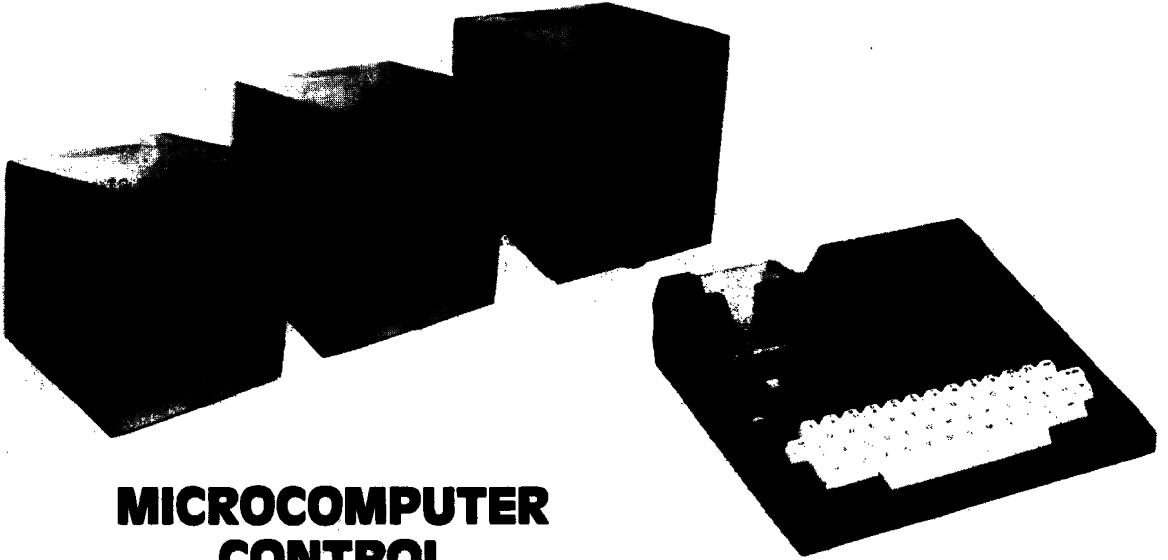


- Air tight animal compartments
- Adjustable speed and tilt.
- Can be combined with Oxygen Consumption Computer for $\dot{V}O_2/CO_2$ measurements.

$\dot{V}O_2/CO_2$ Measurements down to 10^{-6} Liter/Min. for animals, insects, plants, and tissue cultures.



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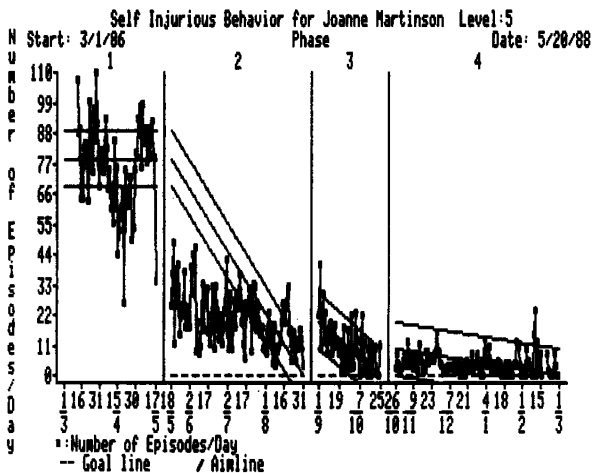
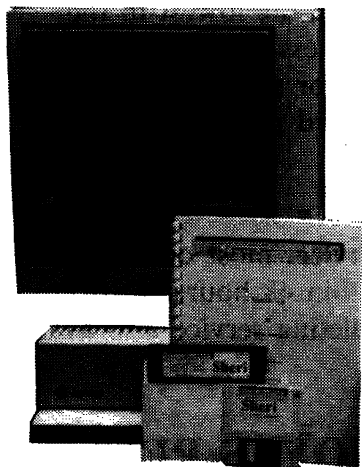
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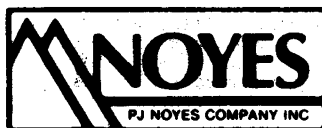


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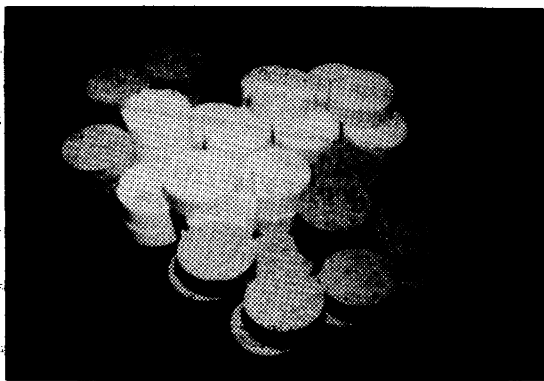
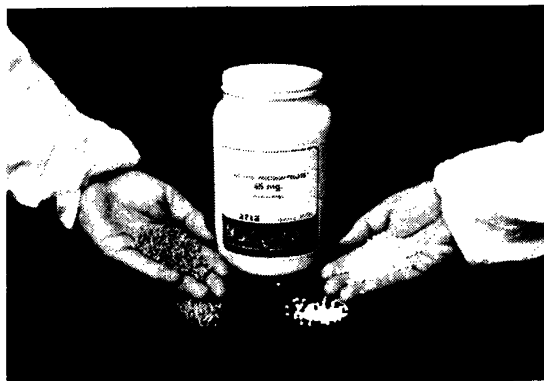
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Volume 16.2 will include:

Selected articles from the Fall, 1988 issue:

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William Bechtel. **Perspectives on mental models.**

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Bruce N. Waller. **Free will gone out of control: A review of R. Kane's *Free Will and Values*.**

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Richard Double. **Free will, an interesting illusion: A review of Galen Strawson's *Freedom and Belief*.**

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 mass of a molecule. The program is written in
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1.1.1.
 1.1.1.1. $10^4 \times 10^4$
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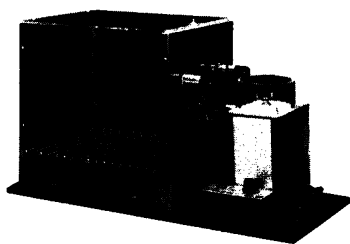
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